

What is claimed and desired to be secured by Letters Patent is:

(1) multi-stage sliding air throttle valve assembly for use with a multiple cylinder engine, comprising:

5 (a): a housing including first and second housing members, each of said housing members having interior and exterior faces, a shifting slot profiled on each of said housing members, said first housing member being securable along said exterior face relative to said engine;

(b): a plurality of ports defining air passageways disposed through each of said housings, each of said ports being alignable with one said cylinder;

10 (c): a plurality of slidable throttle valve plates shiftable from a first position whereby each of said ports is fully open relative to said cylinders and shiftable to a second position whereby each of said ports is fully closed relative to said cylinders, each of said plates including a protruding tab member for operative receipt within one of said shifting slots;

15 (d): at least one throttle plate stop protruding from the interior face of said first housing member and engageable with one of said throttle valve plates for preventing slidable movement of said one throttle valve plate in one direction during engagement;

20 (e): at least one throttle plate stop protruding from the interior face of said second housing member and engageable with another of said throttle valve plates for preventing slidable movement of said another throttle valve plate in a direction opposite said one direction during engagement; and

25 (f): means for shifting said throttle valve plates relative to one another in first directions whereby when said throttle valve plates are in one position, the air passageways are fully open, and when said throttle valve plates are shifted by

said shifting means in second, opposite directions, said air passageways are fully closed.

5 (2) The valve assembly of Claim 1 further comprising at least one non-moveable plate means sealingly disposed between each of said throttle valve plates and for permitting slidable movements of said plates.

10 (3) The valve assembly of Claim 1 or Claim 2, further comprising: an air velocity assembly secured between said engine and said air throttle valve assembly, and including air velocity chambers, each of said chambers having an opening defined therethrough and alignable with the chambers in said engine for the passage of air from the air passageways through each of the housings and the slidable throttle valve
15 plates into said chambers of said engine.

 (4) The valve assembly of Claim 1 or Claim 2, further comprising an air velocity assembly secured between said engine and said air throttle valve assembly, and
20 including air velocity chambers, each of said chambers having an opening defined therethrough and alignable with the chambers in said engine for the passage of air from the air passageways through each of the housings and the slidable throttle valve plates into said chambers of said engine, and further comprising a series of reed
25 valves secured to the air velocity assembly.

(5) The valve assembly of Claim 1 or Claim 2 further comprising a series of reed valves having reed valve passageways therethrough in selective communication with the air passageways through the throttle valve housing members and the valve plates.

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(6) The valve assembly of Claim 1 or Claim 2 further comprising a shifting assembly for shifting each of said plates between said first and second positions.

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(7) The valve assembly of Claim 1 or Claim 2 wherein said means for shifting said throttle valve plates comprises: an operating armature having first and second ends, said first end being secured to and manipulatable by a throttle of said engine, said second end being secured to at least one of a plurality of shifting arms, each shifting arm being secured to a respective tab on said plates, a bridge joining each of said arms for transferring manipulative movements by said armature in a first direction through said shifting arms to move said arms in concert in one direction to shift said plates from one position to another position to at least partially open said passageways and upon manipulation of said armature in a second direction for movement of said arms in concert in a second direction to shift said plates in another direction to at least partially close said passageways, and biasing means secured to said arms for urging said arms in a direction to at least partially close said passageways.

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(8) A two-stroke internal combustion engine comprising:
(a) a cylinder block;

(b) a plurality of combustion cylinders therein, each of said cylinders receiving a mixture of a combustible fuel and air for ignition therein;

(c) a multi-stage air throttle valve assembly secured to said Block, said valve assembly including:

5 (1) a housing including first and second housing members, each of said housing members having interior and exterior faces, a shifting slot profiled on each of said housing members, said first housing member being securable along said exterior face relative to said engine;

10 (2): a plurality of ports defining air passageways disposed through each of said housings, each of said ports being alignable with one said cylinder;

15 (3): a plurality of slidable throttle valve plates shiftable from a first position whereby each of said ports is fully open relative to said cylinders and shiftable to a second position whereby each of said ports is fully closed relative to said cylinders, each of said plates including a protruding tab member for operative receipt within one of said shifting slots;

20 (4): at least one throttle plate stop protruding from the interior face of said first housing member and engageable with one of said throttle valve plates for preventing slidable movement of said one throttle valve plate in one direction during engagement;

25 (5): at least one throttle plate stop protruding from the interior face of said second housing member and engageable with another of said throttle valve plates for preventing slidable movement of said another throttle valve plate in a direction opposite said one direction during engagement; and

(6): means for shifting said throttle valve plates relative to one another in first directions whereby when said throttle valve plates are in one position, the air passageways are fully open, and when said throttle valve plates are shifted by said shifting means in second, opposite directions, said air passageways are fully closed.

(9) The engine of Claim 8 further comprising at least one non-moveable plate means sealingly disposed between each of said throttle valve plates and for permitting slidable movements of said plates.

(10) The engine of Claim 8 further comprising: an air velocity assembly secured between said engine and said air throttle valve assembly, and including air velocity chambers, each of said chambers having an opening defined therethrough and alignable with the chambers in said engine for the passage of air from the air passageways through each of the housings and the slidable throttle valve plates into said chambers of said engine.

(11) The engine of Claim 8 further comprising: an air velocity assembly secured between said engine and said air throttle valve assembly, and including air velocity chambers, each of said chambers having an opening defined therethrough and alignable with the chambers in said engine for the passage of air from the air passageways through each of the housings and the slidable throttle valve plates into said chambers of said engine, and further comprising a series of reed valves secured to the air velocity assembly.

(12) The engine of Claim 8 further comprising a series of reed valves having reed valve passageways therethrough in selective communication with the air passageways through the throttle valve housing members and the valve plates.

(13) The engine of Claim 8 further comprising a shifting assembly for shifting each of said plates between said first and second positions.

(14) The engine of Claim 13 wherein said shifting assembly for shifting said throttle valve plates comprises: an operating armature having first and second ends, said first end being secured to and manipulatable by a throttle of said engine, said second end being secured to at least one of a plurality of shifting arms, each shifting arm being secured to a respective tab on said plates, a bridge joining each of said arms for transferring manipulative movements by said armature in a first direction through said shifting arms to move said arms in concert in one direction to shift said plates from one position to another position to at least partially open said passageways and upon manipulation of said armature in a second direction for movement of said arms in concert in a second direction to shift said plates in another direction to at least partially close said passageways, and biasing means secured to said arms for urging said arms in a direction to at least partially close said passageways.

- (15) The engine of Claim 8 further comprising fuel injector means secured to said block for injecting fuel into each of the combustion cylinders.

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Patent Application - Al Clark.wpd